

What is claimed is:

- Sub
B1
1. A surface acoustic wave device comprising:
a piezoelectric plate; and
at least one interdigital electrode provided on the piezoelectric plate;
wherein the interdigital electrode includes a first metallic thin film and a second metallic thin film laminated on the first metallic thin film and including tantalum as a principal component, at least a portion of the tantalum of the second metallic thin film is α -tantalum.
 2. A surface acoustic wave device according to Claim 1, wherein at least a portion of the first metallic thin film includes titanium.
 3. A surface acoustic wave device according to Claim 1, wherein the first metallic thin film includes a laminated metallic film defined by a plurality of metallic thin films, and at least a portion of the thin metallic film at the side of the laminated metallic film where the second metallic thin film is laminated includes titanium.
 4. A surface acoustic wave device according to Claim 3, wherein the metallic thin film other than the metallic thin film laminated with the second metallic thin film of the laminated metallic thin film includes a metal containing Au, α -tantalum, β -tantalum, W, Ag, Mo, Cu, Ni, Fe, Cr or Zr as a principal component.
 5. A surface acoustic wave device according to Claim 1, wherein the thickness of the first metallic thin film is about 3 nm or more.

6. A surface acoustic wave device according to Claim 1, wherein the piezoelectric plate and the at least one interdigital electrode are arranged to utilize shear horizontal waves.

7. A surface acoustic wave device according to Claim 1, wherein the at least one interdigital electrode includes a plurality of electrode fingers interdigitated with each other, the width of the electrode fingers located at both ends along the propagation direction of the surface acoustic wave is about $\lambda/8$, where λ denotes the wavelength of the surface acoustic wave.

8. A surface acoustic wave device according to Claim 1, wherein the at least one interdigital electrode includes a plurality of electrode fingers interdigitated with each other, the width of the electrode fingers located in between both ends along the propagation direction of the surface acoustic wave is about $\lambda/2$, where λ denotes the wavelength of the surface acoustic wave.

9. A surface acoustic wave device according to Claim 1, wherein the at least one interdigital electrode includes a plurality of electrode fingers interdigitated with each other, and the distances between adjacent ones of the corresponding electrode fingers are about $\lambda/2$, where λ denotes the wavelength of the surface acoustic wave.

10. A surface acoustic wave device according to Claim 1, further comprising reflectors provided at ends of the piezoelectric plate to reflect surface acoustic waves therebetween.

11. A method for manufacturing a surface acoustic wave device comprising:

providing a piezoelectric plate; and

forming a first metallic thin film on the piezoelectric plate; and

forming a second metallic thin film on the first metallic thin film, the second metallic film including tantalum as a principal component and at least a portion of the tantalum of the second metallic thin film is α -tantalum.

12. The method according to claim 11, wherein the first metallic thin film and the second metallic thin film are formed on the piezoelectric plate via sputtering.

13. The method according to claim 11, wherein the first metallic thin film and the second metallic thin film are formed on the piezoelectric plate via vapor deposition.

14. The method according to claim 11, wherein the first metallic thin film is formed to have a bi-layer structure of a lower tungsten thin film and an upper titanium thin film.

15. The method according to claim 14, wherein the second metallic thin film is formed on the upper titanium thin film and further comprising the step of converting the second metallic thin film into α -tantalum.

16. The method according to claim 11, wherein at least a portion of the first metallic thin film includes titanium.

17. The method according to claim 11, wherein the first metallic thin film includes a laminated metallic film formed by a plurality of metallic thin films, and at least a portion

of the thin metallic film at the side of the laminated metallic film where the second metallic thin film is laminated includes titanium.

18. The method according to claim 17, wherein the metallic thin film other than the metallic thin film laminated with the second metallic thin film of the laminated metallic thin film includes a metal containing Au, α -tantalum, β -tantalum, W, Ag, Mo, Cu, Ni, Fe, Cr or Zr as a principal component.

19. The method according to claim 11, wherein the thickness of the first metallic thin film is formed to be about 3 nm or more.

20. The method according to claim 11, wherein the piezoelectric plate and the at least one interdigital electrode are arranged to utilize shear horizontal waves.